

Claims:

1. A bag splitting apparatus for use in  
splitting open bags containing solid waste,  
5 comprising:

a rotatable flail structure having a plurality of  
flexible flails attached to a rotatable mounting, the  
flails being formed from a material having a Young's  
modulus of less than  $50\text{GN/m}^2$ ; and

10 a waste feed guide structure capable of receiving  
bagged solid waste and directing it towards the  
rotatable flail structure when the apparatus is in  
use.

15 2. An apparatus as claimed in claim 1 wherein  
the flails are formed from a material having a Young's  
modulus of less than  $20\text{GN/m}^2$ .

20 3. An apparatus as claimed in claim 2 wherein  
the flails are formed from a material having a Young's  
modulus of less than  $10\text{GN/m}^2$ .

25 4. An apparatus as claimed in claim 2 wherein  
the flails are formed from a material having a Young's  
modulus of less than  $5\text{gN/m}^2$ .

5. An apparatus as claimed in claim 1 wherein  
the flails are formed from a plastics material.

30 6. An apparatus according to any one of claims  
1 to 5 wherein the rotatable flail structure is  
adapted to rotate at at least  $11\text{ ms}^{-1}$  when the device  
is in use.

35 7. An apparatus according to any one of claims  
1 to 6 wherein the waste feed guide structure  
comprises a feed chute having a top chute portion and

a bottom chute portion, the bottom chute portion being attached to the top chute portion at a hinged joint to allow independent movement of the bottom chute portion relative to the top chute portion about the hinged joint, wherein the bottom chute portion is operable to direct bagged solid waste introduced into the feed chute towards the rotatable flail structure when the apparatus is in use.

8. An apparatus according to claim 7 which comprises a balance weight attached to the bottom chute portion to maintain the bottom chute portion at a pre-determined angle to the vertical whilst allowing deflection of the bottom chute portion away from the rotatable flail structure when a deflecting force is applied to the bottom chute portion.

9. An apparatus as claimed in claim 7 or claim 8 wherein the top chute portion comprises an adjustable back plate which is hinged to the bottom chute portion and capable of independent movement relative to the bottom chute portion about the hinge.

10. A wet separator apparatus adapted for use in separating solid waste according to density comprising:

a separation tank containing a body of liquid;  
means for creating a horizontal flow within the liquid such that when solid waste is received in the body of liquid it is separated substantially into a heavy solid waste fraction having a density above a certain threshold and light solid waste fraction having a density below the threshold;

means for separately removing the heavy and light solid waste fractions from the separation tank.

11. A wet separator apparatus according to claim

10 wherein:

the means for removing the heavy solid waste fraction from the separation tank is a heavy discharge conveyor a part of which is positioned within the separation tank in alignment with the site of addition of waste into the tank, such that heavy solid waste falling under gravity substantially vertically towards the bottom of the tank below the site of addition is collected on the heavy discharge conveyor and conveyed out of the tank; and

the means for removing the light solid waste fraction from the separation tank is a light discharge conveyor a part of which is positioned within the separation tank spaced away from the site of addition of waste into the tank in the direction of the horizontal flow of liquid within the tank, such that light solid waste which is carried laterally by the flow of liquid within the tank away from the site of addition is collected on the light discharge conveyor and conveyed out of the tank.

12. An apparatus as claimed in claim 11 which comprises an adjustable baffle plate positioned within the separation tank between the heavy discharge conveyor and the light discharge conveyor to separate material falling under gravity onto the heavy conveyor and material carried laterally onto the light conveyor.

13. A waste processing system for processing bagged solid waste comprising:

a bag splitting apparatus for splitting open bags containing solid waste comprising a rotatable flail structure having a plurality of flexible flails attached to a rotatable mounting, the flails being formed from a material having a Young's modulus of less than  $50\text{GNm}^{-2}$  and a waste feed structure capable

of receiving bagged solid waste and directing it towards the rotatable flail structure when the apparatus is in use; and

5 a wet separator apparatus for separating solid waste according to density comprising a separation tank containing a body of liquid, means for creating a horizontal flow within the liquid such that when solid waste is received in the body of liquid it is separated substantially into a heavy solid waste  
10 fraction having a density above a certain threshold and light solid waste fraction having a density below the threshold, and means for separately removing the heavy and light solid waste fractions from the separation tank.

15 14. A waste processing system according to claim 13 wherein the bag splitting apparatus is an apparatus according to any one of claims 2 to 9.

20 15. A waste processing system according to claim 13 or claim 14 wherein the wet separator apparatus is an apparatus according to any one of claims 10 to 12.

25 16. A waste processing system according to any one of claims 13 to 15 wherein the bag splitting apparatus is positioned in close proximity to the surface of the liquid in the separator tank such that any bags that are not split as they pass through the bag splitter apparatus but float on the surface of the  
30 liquid in the separator tank are maintained in contact with the rotatable flail structure.